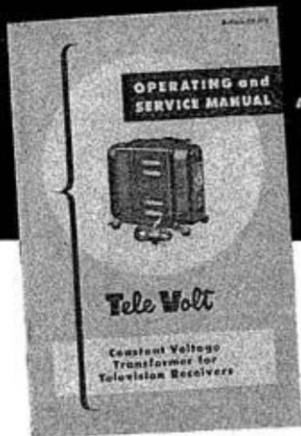


TV Voltage Trouble?

WRITE FOR
THIS HELPFUL
TeleVolt BULLETIN



The Sola TeleVolt Bulletin can save you many hours and make you many dollars. It shows how you can automatically correct bad line voltage . . . high, low, and fluctuating voltage. The TeleVolt automatically maintains proper voltage levels for proper performance and protects costly TV components against damaging high voltage surges.

The Sola TeleVolt, Constant Voltage Transformer, is not a voltage booster . . . it is a patented voltage regulator that automatically stabilizes voltage to within $\pm 3\%$ of nominal value, regardless of line voltage variations as great as $\pm 15\%$.

Write today for Bulletin AE-CV-175
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4633 W. 16th St. Chicago 50, Ill.

COLOR

SHORTS

Late in July, the National Television System Committee asked the Federal Communications Commission to adopt its proposed new and improved standards (see below). The petition was approved by members of the NTSC on July 21 and subsequently filed by Dr. W. R. G. Baker as Chairman of NTSC. The action cleared the way for early Commission consideration of the whole color-TV question, including the petition filed on June 25 by RCA and NBC, and the expected repeal of the CBS color-wheel standards adopted almost three years ago. NTSC in its petition stated that other companies, in addition to RCA, also would petition the FCC for adoption of the proposed color standards. Already filing are Philco, GE, Sylvania, Motorola and others.

Members of NTSC have been working on the new color standards for more than two years. During that time hundreds of thousands of engineering man-hours have been contributed by the most highly skilled engineers and scientists in the electronics industry and in related research groups. Among these engineers and scientists comprising the committee, some 85 television and electronic companies are represented, in addition to independent consulting firms and other groups interested in color television. Dr. A. F. Murray, Dr. O. H. Caldwell and

B. F. Osbahr have represented Caldwell-Clements, Inc., publishers of *TECHNICIAN*, in NTSC meetings.

Present sets receive color broadcasts as black-white pictures of even better quality than before. When color receivers are used, there is received and produced a color picture which has a high quality of color fidelity, adequate apparent definition and good picture texture. The standards proposed are an improvement over existing television standards in that they permit the broadcasting of color and simultaneously provide black-and-white sets with a high-quality black-and-white picture. No changes will be necessary in present sets to permit them to continue to receive a black-and-white picture from transmissions in color.

More than 100 engineers worked on one type of field test alone, tests which were made over five transmitters, using television sets of 12 different manufacturers.

CBS announces it will not only support the move to substitute the NTSC compatible standards for the present incompatible standards but will on Sept. 15 start providing some programs to its affiliated stations on an experimental basis, using the NTSC standards of transmission.

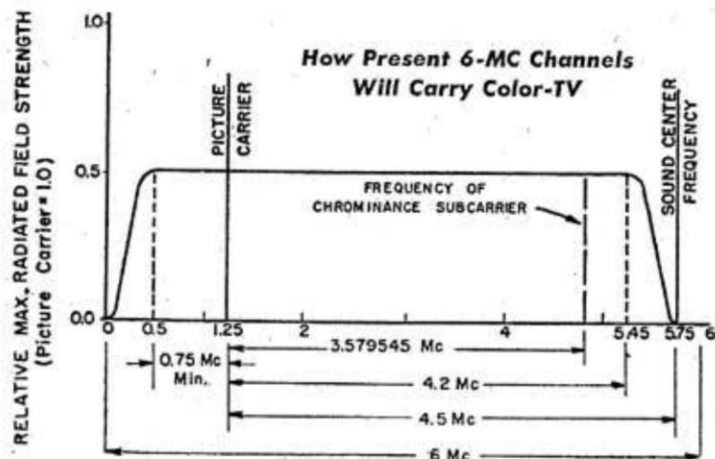


Diagram shows relative amplitude and frequency characteristics of compatible color-TV signal. Note particularly location of chrominance subcarrier at appr. 3.58 MC. In operation, the chrominance signal is vestigially modulated on the subcarrier, but in this case, upper side-bands are removed.

COLOR

SHORTS

ALREADY NBC is making elaborate plans to put color-TV programs over its network reaching 55 stations. Leading shows will be prepared for color-presentation as follows:

Oct. 6 Dinah Shore
 Oct. 11 Paul Winchell
 Oct. 18 TV Playhouse
 Oct. 24 Your Show of Shows
 Nov. 7 Hit Parade
 Nov. 17 Bob Hope

All color-TV shows will be put on from NBC's Colonial Theatre in New York City, which is equipped with four color cameras. Pending FCC color-TV approval, the above commercial shows will be produced and rehearsed in full color techniques, but broadcast in black-and-white. Warner's big sound stage in Brooklyn is also being fitted out for color-TV production.

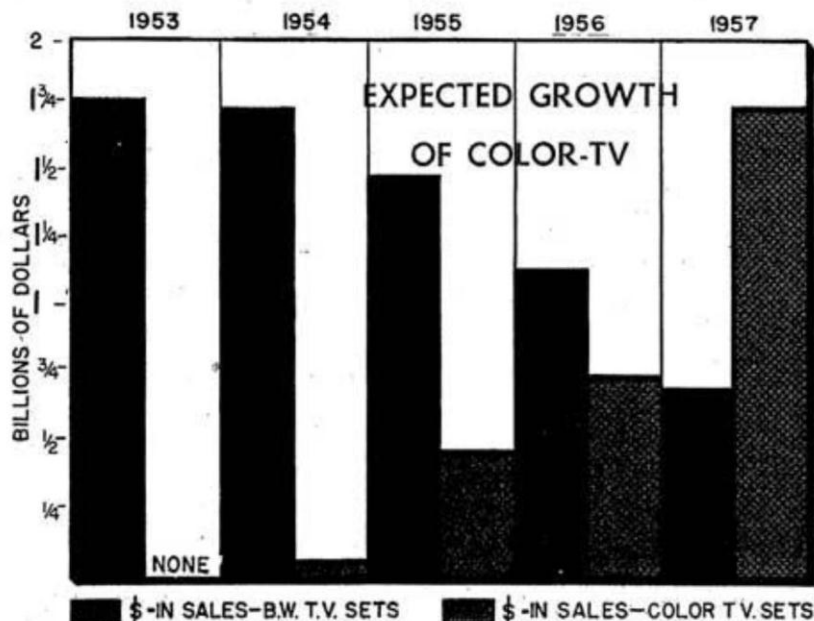
COLOR RECEIVERS will not be on the market in quantity until sometime in 1954. Meanwhile, at New York, NBC is equipping the 300-seat Bijou Theatre, 209 W. 45th St., with movie-size-screen color facilities. The theatre will be used for public demonstrations of color until mass production of receivers is achieved.

DR. W. R. G. BAKER, NTSC chairman, and GE vice-president, has delivered to Chairman Hyde of the FCC a 16-volume, 52-pound ex-

hibit reporting results of the NTSC's two-and-a-half years of technical studies of the problems involved. The proposed committee system offers color telecasts that could be tuned in by existing sets in black and white. If color reception were desired, a color set would have to be purchased in most cases since the industry generally does not consider "converters" practical, although a few engineers propose methods of "converting" present black-and-white sets.

EMERSON TV sees an early reduction in the high prices of color receivers, and has announced that once color-TV gets the go-ahead signal from FCC, it will produce receivers at prices only 25% above the cost of present black-and-white sets. Benjamin Abrams, Emerson president, said that the company would attempt to turn out such sets within 18 months after FCC approval of the new industry-sponsored compatible color system.

CBS HAS FORMALLY requested FCC to approve the new NTSC compatible color standards, and to cancel further authorization of the CBS "spinning-color-wheel" incompatible system which the FCC had officially adopted in 1950. Meanwhile CBS is carrying on experimental network color broadcasts using the NTSC standards.



With Complete
Color-TV
Schematic

TECHNICIAN

(Formerly the TECHNICIAN SECTION of "TELEVISION RETAILING")

For Color-TV Set
To Operate on
NTSC Standard

Color TV is Coming Fast

"GET READY FOR COLOR TV!" is advice given TV servicemen by industry leaders. They see early approval of NTSC standards by FCC, leading to marketing of first color receivers in 1954. Probably 1% to 3% of TV production will be color sets this coming year (50,000 to 100,000 color receivers). In '55, 20% to 25%, (1 million color sets). In '56, 35% of total production (2 million color sets). By the close of '58, we estimate 28% of total TV sets in use will receive in full color.



TUNING IN THE COLOR PICTURE at New York demonstration last month—most impressive color-TV show-

ing to date on NTSC standards, presented by RCA. Traveling over a 4,000-mile relay, the program was also viewed in Burbank, California. Color quality was excellent. Subtle hues and textures reproduced very well. Color film, making its bow on transcontinental TV, compares well with the live portion of the show. Due to enhancing effect of color, smaller-size picture tubes seem to be acceptable from normal viewing distance. Parts of program were shown in black-and-white for comparison. Defects still evident: slight "crawling" noted at color change, but not disturbing; some pin-cushioning of picture and raster, possibly due to tube design; smearing of picture content in fast-motion sequences. The latter, also evident on black-and-white portion of show, may not be a peculiarity of color-TV. Tube "bugs" may be at fault.

COLOR-TV, FAMILY ROWS!—Color television seems certain to precipitate some lively family discussions. The wife, who has deferred to the head of the household in black-and-white TV matters, may be coming into her own. The hoots and howls that are set up when the husband insists he has properly tuned in may be very disturbing to masculine dignity. The severest critics of color TV are apt to be the girls; they are going to love to tinker with the chrome control.

COLOR

SHORTS

SERVICING INFO ON COLOR—Early dissemination of technical information on the servicing of color receivers is planned by the RETMA Service Committee, under Chairman H. J. Schulman, DuMont. Following a thorough discussion on methods of distributing such data to servicemen in the field, two subcommittees have been appointed to work out procedures. Former Service Committee Chairman Ray J. Yeranko, Magnavox, was named Chairman of a mid-western subcommittee, and John H. Craft, Jr., of Stromberg-Carlson, of an eastern subcommittee. Besides developing methods and procedures, the two groups were authorized to request a special meeting of the full Service Committee when they are ready to report. Initially, the program will be carried on by manufacturers' field representatives who will be furnished technical information by RETMA.

NTSC TO DISSOLVE—The National Television System Committee, made up of representatives from all branches of the television industry, which has prepared the specifications of standards on which future American color-TV is expected to operate, will be dissolved after the FCC has given its approval to the NTSC standards. Dr. W. R. G. Baker, chairman of NTSC, explains that whatever further standardization work is required, will be carried on by a TV Systems Committee of the RETMA Engineering Department of which Dr. Baker is chairman, and Ralph R. Batcher is chief engineer.

AFTER WATCHING three network color-TV programs in his own home—(1) "Carmen," (2) Mike Wallace variety, and (3) the "Comedy Hour," Jack Gould, radio-TV editor of the N. Y. Times, has come to one inescapable conclusion. If the quality of the color program is either second rate or not to individual taste, the owner will have no reluctance to turn the color off and look for something better in black and white. Even after a very short time of sustained looking at color under normal home surroundings it is surprising how quickly the color is accepted as a matter of course and interest shifts to the older and more familiar program values, i.e., quality.

DOUBLE TROUBLE—Color-TV receivers will require approximately twice as many components as standard black-white sets, according to a color-TV expert, W. D. Swinyard, chief engineer of Hazeltine Research. Whereas an average black-white set has 20 tubes, with 5 resistors and 5 condensers per tube, a color receiver will have 36 tubes, with 7 resistors and 6 capacitors per tube. In addition several new mechanical and electrical parts are required. As time goes on the tube complements of color sets are expected to be reduced to 25 or 30 units. New pieces of test equipment will also be required to service color sets.

COLOR-PICTURE DETAIL—In commenting on the picture quality under the NTSC standards, Mr. Swinyard said that detail in a monochrome picture received on a color-television receiver is only about one percent less than that achieved by a black-and-white set. UHF color transmissions are received with the same degree of quality as VHF color signals. Interference is no more harmful to color pictures than it is to black-and-white pictures, he said, except when the interference is from

a frequency very close to the color sub-carrier frequency. In answer to questions, Mr. Swinyard pointed out that color television will require additional "know-how" on the part of servicemen.

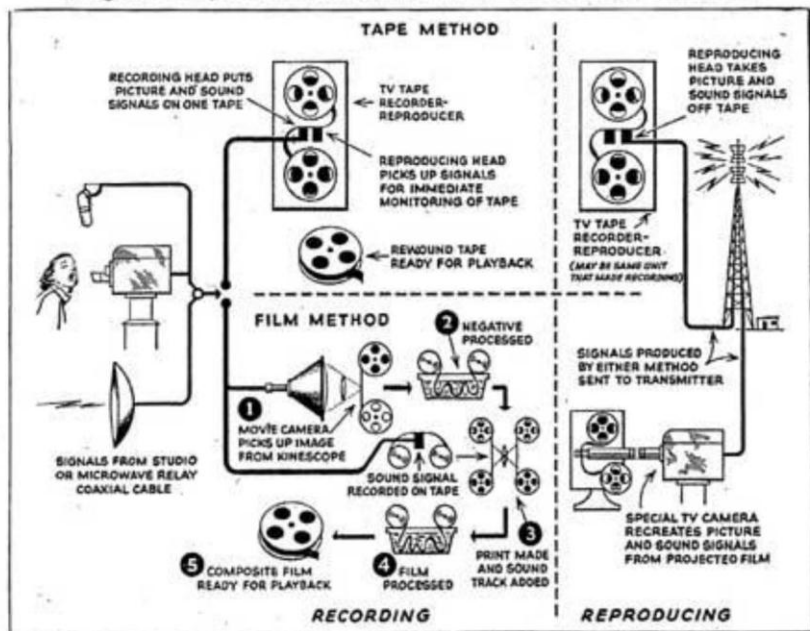
COLOR TV SERVICE PROBLEMS are getting early consideration. Dan R. Creato, vice-president of the RCA Service Co., says a practical book for the service industry on color TV is near completion. The text will be the basis for intensive nationwide training courses, RCA-sponsored, as soon as FCC gives the green light on color.

PRESENT TEST EQUIPMENT, says Creato, should continue to be usable, but a crosshatch or dot generator will probably have to be added. Where a color TV signal is not always available, a color bar signal generator will also be needed.

MOST ANTENNA INSTALLATIONS now in successful use will be adequate for color reception, but multiplex systems are likely to give trouble. To allow proper use of the color signal, antennas, boosters, distributor systems and the like will have to provide flat response.

COMPONENT REQUIREMENTS for color receivers are also being anticipated. Crest Laboratories, Rockaway Beach, N. Y., has introduced a line of variable inductances designed for the new circuitry, as shown in NTSC schematics already released.

Magnetic-Tape vs. Film Recording of Color-TV, Compared



New RCA developments in 3-megacycle magnetic recording, open way to reproduce TV and color-TV pictures from magnetic tape, like sound.

COLOR

SHORTS

MORE TRAINING NEWS: Last month, CBS began 5-day, 35-hour seminars at its plant in Long Island City, N. Y., which are still continuing. Discussions and demonstrations cover color principles, the CBS Colortron, circuitry, components, installation and maintenance. RCA color service clinics also teed off during February in 15 major cities—New York, New Haven, Newark, Philadelphia, Pittsburgh, Washington, Cleveland, Cincinnati, Detroit, Chicago, St. Louis, Des Moines, Denver, San Francisco, and Los Angeles. Other major cities will be covered during the rest of the year.

RCA'S 19-INCH TRICOLOR TUBE, now in the development stage, is expected to be commercially available in limited quantities in the latter half of this year. Its pumpkin-faced viewing screen will reproduce pictures in about the size available from 16-in. round tubes. Directly below you see the 19-incher com-



pared with the company's 15-in. tube, which is now in production. Based on the earlier tube, the 19 incorporates some design changes: new gun assembly, improved phosphors, modification of the shadow mask and a wider deflection angle. The latter makes possible an overall length no greater than that of the 15-in. crt.

A **21-INCH TUBE** is also in the works at RCA. This rectangular color crt will incorporate fundamental design changes. The shadow mask will be replaced by a focus mask. Tube brightness will be stepped up. Commercial production is expected next year.

CONVERGENCE, FOCUS and high-voltage transformers, as well as deflection yokes, are color receiver components that are scheduled to be

available to manufacturers in mass production quantities at just about the time you read this item.

DU MONT TRAINING PLANS for color TV, now being developed, will include lectures, actual bench work, personal assistance in handling color receiver problems and a booklet on the subject similar to the one issued by this organization on UHF. Emphasis is being placed on developing a complete program rather than on getting it into operation immediately. Du Mont promises the program will be in effect in time for technicians to handle its color sets.

LUCKY OWNER of a color set tried this experiment during a color telecast: He placed his old b & w receiver beside the new one and tuned it to the same program. Except to make quick comparisons, none of the viewers present paid attention to the b & w version. This despite the fact that faulty transmission was throwing color balance way off. His conclusion: even bad color TV is better than none at all.

ANTENNA DESIGN has already felt the influence of color. While many antennas now in use will continue to be entirely satisfactory, sharply-tuned single-channel arrays, like yagis, may need replacement. This opinion was voiced by Ira Kamen, vice-president of Brach Manufacturing Co., in an engineer-

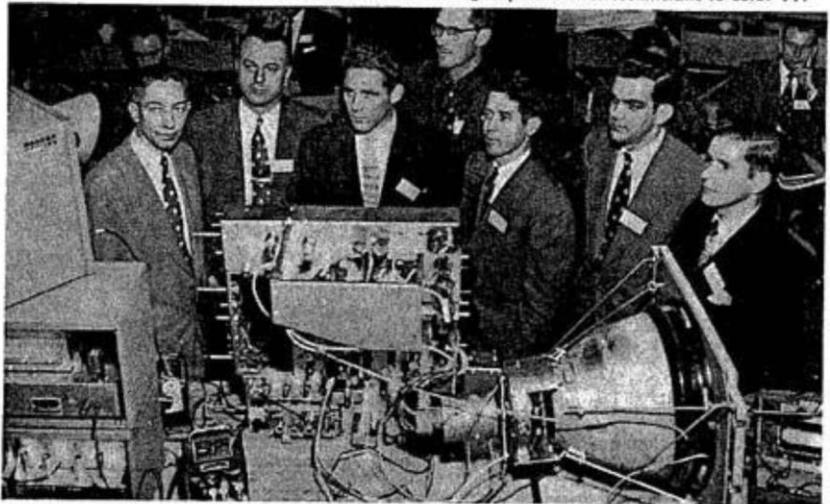
ing report. All antennas in the new Brach line are being designed with color in mind. Single-channel yagis are being broadbanded sufficiently to preclude dips and valleys; normal broadband designs are being engineered to reject FM signals and side-lobe pick-up on all types is being minimized.

THE COLOR SERVICE BONANZA will not be free of headaches even for the technician who gets to know his color receiver inside-out. Present high resistance to b & w service charges is expected to be much greater in the case of color TV maintenance, since the number of calls needed, as well as the charge per call, is bound to go up. Advance estimates for average number of service calls per year go as high as 11 per color set. Let your customers know about this NOW—save headaches later.

CHEERFUL NOTE on service: despite the increased complexity of the color set, picture symptoms will provide more clues to the actual trouble than is the case with b & w receivers.

GE'S RECENT SEMINAR on color TV, held at the GE Syracuse plant, was attended by 200 distributor and dealer service technicians. The week-long seminar (35 hours) covered all phases of color TV alignment and service.

W. L. Parkinson of G.E. (extreme left) introduces a group of service technicians to color TV.



COLOR SHORTS

THIRTY ADMIRAL FIELD AND SERVICE engineers attended the school's training program, which ended recently after running for a month. Eight days of the course were devoted to color theory and fundamentals; the remainder of the month was devoted to practical work (installation and service) on receivers. Students were chosen from those now able to receive network or broadcasts. Eligibility of future students will also depend on availability of color programs in their localities. Text for the course was produced by Admiral staff engineers.

DETROIT WAS THE KICK-OFF POINT for a nationwide program of color TV service training meetings scheduled by G.E. in March. The 4-day Detroit session, held at the Mason Auditorium, was attended by about 800 G.E. service employees and service personnel of the company's dealers. Open invitations are being extended to all service technicians to come to other meetings.

ANDREA RADIO CORPORATION recently demonstrated a color television set to some of its distributors. Production models, expected during second or third quarter of this year, will be available in limited quantities. The openface console set provides a 15-in. pumpkin-face picture on a 3-gun tube. Price has not been set.

View of Andrea's first color TV receiver.



TECHNICIAN • April, 1954

COLOR-BLIND TECHNICIANS were weeded out of the candidates applying for admission to Admiral's color TV training school. These technicians, who were discovered through tests, were not permitted to take the course; their future service activities will be confined to b & w TV. Tests were administered because more than 10 million Americans (about 7 percent of our population) are said to be color blind to some degree.

HARTFORD AND BRIDGEPORT, Conn., were the scenes of G.E. 8-hour training sessions. Three-day meets were being scheduled for Philadelphia, Cleveland, Boston and Los Angeles. The shorter sessions cover theory and fundamentals. In the longer meetings, instruction in the alignment and service of G.E. color receivers is being offered.

MASTER ANTENNA SYSTEMS suitable for use with color receivers are now a reality. It has been known for some time that existing distribution systems used with b & w sets may not be sufficiently linear, or have enough shielding against interference, to feed a good signal to color sets. The large collection of color receivers displayed at the recent Sixth Annual Music & TV Festival at Macy's in New York were fed from a master system built by Jerrold. Macy executives were pleased with the operation of the set-up.

DU MONT'S FIRST TRAINING EFFORTS in color have taken the form of a series of articles in that company's monthly, *Du Mont Service News*. The first installment presents a theoretical discussion of light and color, color properties, color vision and color reproduction. This initial article fills most of the *Service News* issue in which it appears.

IMMEDIATE DELIVERY on Westinghouse color sets—production models—is being offered in some parts of the country. After advertising these receivers for more than a week, Wanamaker's in New York reports the sale of one set. Price is \$1250 for an open-face console set that produces a picture 12½ inches in diameter. Contract service, han-



Now on sale—Westinghouse color console.

dled by Westinghouse, is offered at \$60 for 90 days. Charges for one year come to \$240. Not a bad fee, if you can get it.

PHILCO DISTRIBUTOR SERVICE MANAGERS are finishing a course of color studies in Philadelphia. Through service clinics and meetings, they plan to pass on this knowledge to technician members of the company's factory-supervised service plan. In addition to the 2-week 80-hour course just referred to, Philco is preparing another of the same duration, to be offered to independent service technicians and dealers through local distributors. Lectures will be given for 40 hours; the remaining 40 will be devoted to actual shop practice.

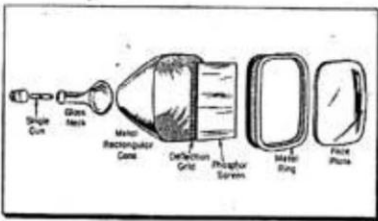
GRADUAL TRANSITION will be the keynote of the change from monochrome to color, opines William R. Feingold, Emerson's senior TV engineer. Feingold says that Emerson has shifted from a 47-tube multiple-chassis design to a 34-tube single-chassis receiver. Many more such alterations will be necessary, Feingold believes, before color sets can be considered to have received a final "shakedown."

REPLACEMENT COMPONENTS for color sets are now available for sale to the service industry in New York City. At least one distributor-jobber, Harvey Radio Co., now carries a complete line of RCA color TV components.

COLOR SHORTS

THE COLOR TV BOTTLENECK will not be broken, opines GE's Dr. W. R. G. Baker, until a 21-in. color set is available at a "reasonable price." "The nub of the problem," says Dr. Baker, "is the color tube, to which no one, as of this date, has a satisfactory and conclusive answer." Although confident that the problem will be resolved, Dr. Baker believes color "may take a little longer than the optimists in the industry predicted." He does not foresee a big color year until 1956.

SERVICE CONTRACT CHARGES set up by GE for its color set have been tentatively listed as follows: For installation and adjustment of the set in the home, unlimited service calls for 90 days, and one-year warranty on picture tube and parts—about \$100; the same terms plus unlimited service calls for a full year—about \$150.



Exploded view showing components before assembly in Westinghouse rectangular 1-gun color crt. (See first item in last column.)

19-IN. 3-GUN CRT RCA engineers have developed is not simply an enlarged version of the 15-inch now in production. Changes in the receiver circuit, as well as in the tube itself, are involved. Overall length is the same for both tubes—the result of increasing the deflection angle in the larger tube from 45 to 59 degrees. Required 2nd-anode voltage is stepped from 20 to 27 kv. Magnetic instead of electrostatic fields are used to obtain convergence. The convergence voltage and the dynamic focusing arrangement are no longer used. Design of the electron gun assembly has been changed. Diameters of apertures in the tube's mask grow progressively smaller away from the mask's center. This reduces color fringing along the edges of the picture.

COLOR-BLIND SERVICE TECHNICIANS CAN RELAX, if the findings of Carl Finzer, instructor in Motorola's color TV school, are correct. The reason (according to Finzer): getting good color depends on adjusting a color set to produce a proper b & w picture—which does not require perfect color vision. "If a man can adjust a color set to receive a clear black and white picture, he can be sure of getting a good color picture . . . We have yet to have a serviceman attend our school who couldn't adjust a good black and white picture on a color set."

AN OPEN-FACE COLOR CONSOLE FOR \$1000 has been announced by GE. The set, model 15CL100, uses a 3-gun tube with a 15-in. outer diameter. It features 35 tubes plus 6 rectifiers.

E. C. CAHILL OF RCA announced a color signal generator, to be used at the transmitter, which will facilitate installation and adjustment of color receivers in the home while b & w program material is being transmitted. The generator, to be used during station identification breaks, adds a vertical yellow-green stripe to the right-hand side of the station identification pattern. This provides a periodic color signal without interrupting regular b & w service. On a b & w receiver, the stripe is virtually imperceptible. The composite b & w video signal is fed into the generator. Output is the same signal—with the yellow-green signal burst added to the video information and a color-sync burst added to the horizontal sync pulse.

Black-and-white station identification pattern with vertical color stripe imposed (at right).



Model of single-gun color crt made by Thomas.

SINGLE-GUN COLOR CRT'S are coming into sharper focus with some new developments in design. Thomas Electronics, licensee of Chromatic Labs., is showing a 21-in. rectangular glass-shell tube using the Lawrence gun. Westinghouse, also using the Lawrence single gun, is showing a 24-in. rectangular metal-cone crt. Chromatic believes 24-in. color crt's will eventually sell for less than \$100. The grid structures (heart of this type of tube) are being made at a faster rate than originally promised. The figure of 25,000 to be made in 1954 is being revised upward. In experimental single-gun types now being worked on, the number of phosphor strips per inch on the screen is being increased. This factor is said to improve picture definition to the point where it compares favorably with definition on b & w crt's.

A FACTORY SCHOOL set up by Emerson to train its distributors' technicians in the handling of color receivers, is now being operated in New York. Duration of the course: 40 hours (5 days). Class size is being kept small to permit better attention to individual students.

TRAINING NOTES: "Final" examination in Admiral's current color school checks the students' ability to repair a defective color receiver . . . More than 27,000 service technicians are said to have attended the first 35 sessions in RCA's nationwide series of color clinics, being held in 65 cities . . . More than 80,000 copies of RCA's *Practical Color Television for the Service Industry* have been distributed.

COLOR SHORTS

HOW FAR COLOR WILL ADVANCE depends, to a great extent, on how far sponsoring advertisers will go in supporting it. The added cost of color broadcasting will definitely be a factor. An encouraging note is sounded by J. L. Van Volkenburg, president of CBS Television. When color TV reaches full maturity, he estimates, it will cost only 10 percent more to advertise in color than in monochrome. Wonder whether we'll ever be able to say the same thing about the cost of color receivers?

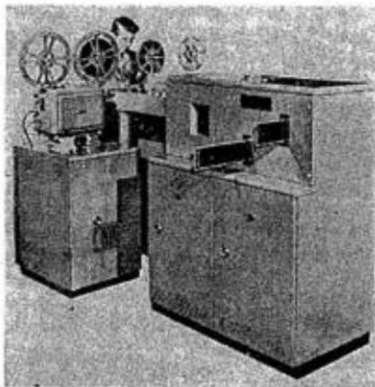
SOME INDUSTRY LEADERS want you to let your customers know that service will probably be required on color sets from the outset. They urge the sale of these receivers with service contracts. Reasoning behind the suggestion: glossing over the need for early servicing may undermine confidence in the industry.

THREE PIECES OF TEST EQUIPMENT for color, announced by RCA, will soon be available: color-bar generator WR-61A, which produces a test pattern of 10 color bars on the receiver screen, for use in adjusting phasing and matrixing circuits; portable dot-bar generator WR-36A, used in making all convergence adjustments; and dual-bandwidth oscilloscope WO-78A, for observing the color-burst signal and checking color-burst circuits. Prices and additional specifications will be announced when the instruments are released for distribution.

COLOR ONLY: New York City's 1st UHF channel will go into construction soon. This city-owned non-commercial station may transmit exclusively in color from its start.

RAYTHEON is actively distributing its version of the 15-in. 3-gun color tube, the 15GP22, from its recently built plant at Quincy, Mass. First delivery to a parts distributor was to American Television, Inc., New Haven, Conn. a distributor for Raytheon tubes. The new Quincy plant has been set up for mass production of monochrome and color pix tubes.

DU MONT'S COLOR MULTI-SCANNER for presenting color films on TV is said to be a boon to limited-budget telecasters. The device, which is expected to make about 80 percent of current 16-mm color film libraries immediately available for broadcast, in quality comparable to that of live color programs, opens a wide range of additional material for use when color TV goes into heavy operation.



Du Mont Color Multi-Scanner eliminates costly camera equipment in film presentations.

TRANSPARENT SLIDES, in addition to motion pictures, may be picked up and transmitted with the scanner. This possibility should be important in the presentation of still commercials. In addition to its usefulness with color films made by all popular processes, the device may be used for scanning black and white films. A special technique called *electronic masking* may make it possible to improve the quality of color films during TV presentation, since it permits adjustment of color saturation and overall brightness. If desired, skies can be made bluer and grass can be made greener. First public showing of the multi-scanner was at the NARTB convention in Chicago, May 23.

AS OF THIS WRITING, there will be four hours of color programs available from two leading networks this month. NBC and CBS each plan four half-hour shows during the month. ABC is adopting a wait-and-see attitude.

RECOMMENDATIONS RE THE TEST BURST GENERATOR introduced by RCA and discussed in last month's **TECHNICIAN** are being considered by the Radio-Electronics-Television Manufacturers Association. A subcommittee of the RETMA Service Committee is reporting on the color burst generator, which adds a yellow-green vertical stripe on the right-hand side of the raster when a monochrome test pattern or station-identification pattern is being sent out. The stripe will be useful in installing a color set when no color broadcast is available, in adjustment of the set by the owner preceding a color program, and by the technician in checking for partial or complete loss of the subcarrier or other color information somewhere in the system.

ANOTHER RETMA DEVELOPMENT is a lecture program for service technicians. The lecture package, including text and slides, is being distributed to RETMA members at nominal cost. The first industry-approved explanation of NTSC color, it is designed to establish a basic and uniform level of technical know-how, from which individual manufacturers of receivers, components, test equipment and other products can plan their own technician training programs. Non-RETMA members and individual service technicians can procure this material from member companies.

THE LAWRENCE TUBE is the subject of a 19-page booklet recently released by Chromatic Television Laboratories, Inc. Essentially a non-technical treatment, the brochure (Reference Memorandum No. 1) nevertheless presents a skeleton explanation of how the single-gun tube works. Also discussed are such factors as picture size, price, associated receiver considerations, advantages believed to be inherent in the single-gun design, and the potential this tube type may have in the future of color TV. . . . Another large crt manufacturer (Eitel-McCullough, Inc., San Bruno, Calif.) has joined the list of those who will be making single-gun Chromatrons.

COLOR SHORTS

LUCKY PRIZEWINNERS at Sylvania's recent color TV clinic in Paterson, N.J., got their awards from Roxanne, lovely and popular TV star. Sylvania's Peter L. Langer explained the problems of color TV at the clinic. More than 400 technicians attended. Grand prize was Sylvania's new color dot generator, model 506. The prizewinners, shown



with Roxanne in the photo, are, from left to right: Howard Buckner (Paterson); Lester Pawlyk (Midland Park); Roxanne; Frank Carbone (Paterson); James Forzono (West Haverstraw); and grand prizewinner William Dunn (Westwood).

THE KANSAS CITY-ST. LOUIS area was the scene of a recently concluded color training program for technicians sponsored by the Hoffman Sales Corp., local distributors of Hoffman TV. The 14-lecture, one-night-a-week course attracted 800 students. An 8-page lesson was mailed to participating technicians prior to each lecture, giving them a chance to study the material in advance. A \$5.00 fee was charged for the course to cover printing, mailing and other expenses. An additional 900 students took the course by correspondence only.

IMPROVED VERSION of the Lawrence single-gun tube, designated the Chromatron PDF 21-3, was announced by Richard Hodgson, prexy of Chromatic Television Laboratories. Using a rectangular glass envelope instead of the earlier bell-shaped cone, the re-designed tube is said to permit a 20 percent reduction in cabinet size without changing picture size. The tube features a new Chromopac (color grid deflecting structure at the front of the tube), which is said to afford a reduction in possibly objectionable radiation.

DU MONT'S 19-IN. Chroma-Sync Teletron will be ready to be used in sets this fall according to Bill Scales, general sales mgr. of the manufacturer's CRT Division. Early deliveries will permit the tubes to go into sets marketed during the pre-Christmas selling season. This color crt was recently demonstrated to members of the FCC, along with the Multi-Scanner, discussed in this space last month.

RMS ANTENNA COLOR FORUM was conducted by Martin Bettan in Haledon, N.J. Pro-and-con discussion of various antenna types, and the role they will play when color TV looms big, lasted for 3½ hours. Because of the difficulties that may be caused even by slight ghosts, rotators may become necessary for pinpoint orientation even in strong-signal metropolitan areas, it was pointed out.

AN ADMIRAL COLOR RECEIVER has been purchased by the Chicago School of Television Service, 1538 W. 63rd Street, for use in a color training course. H. M. Rabin, the school's director, believes his school is the first in the Midwest to have a color set for this purpose. A second Admiral receiver is soon to be purchased. The six-lesson course, which extends over a three-week period, will be open to TV service personnel, as well as presently-enrolled students.

THE RCA COLOR TV BOOK, *Practical Color Television for the Service Industry*, though released last December, is in its 2nd edition. The enlarged text (80 pages) sells for the same \$2.00, but includes additional data on tests instruments and servicing techniques. Complete circuit diagrams have been incorporated for the manufacturer's CT-100 home color receiver. RCA is also offering a 9-lesson home-study course in color, at no charge, on a tube purchase deal. The promotional offer, which will be handled by RCA tube distributors, is open up to November 15, 1954.

Technical new products on pgs.
32, 34, 38, 40, 42, 48

COLOR SHORTS

NEW DEFLECTION YOKE FOR 19-IN. TUBES provides improved convergence characteristics according to the manufacturer, General Instrument Corp. The product of research in an optical laboratory especially set up for such design, the yoke is suitable for use with the three current types of 3-gun tubes;



the planar mask type, the monocoherence shadow-mask type, and the type in which the color phosphors are applied directly to the curved face. The complete yoke with plastic case removed is being held by Edgar Messing, General Instrument exec.

21-IN. SETS FOR ABOUT \$500 IN '55: That's the prediction of Barney Balaban, prexy of Paramount Pictures. Paramount is 50-percent owner of Chromatic TV Labs, developers of the single-gun Lawrence color crt (Chromatron). The prediction is based on the use of the Chromatron . . . Chromatic has issued a full data-specification sheet on development type PDF 21-3, the rectangular glass-shell version of their single-gun tube. Diagonal of the viewing area is about 18 in.

INTEREST AMONG TECHNICIANS in color TV remains high in Kansas, Missouri and Southern Illinois, reports the Hoffman Sales Corp. of Missouri, as evidenced by the success of the six color schools in this area now being conducted by this outfit. As an example, David Doss, Hoffman gen. mgr., points to an attendance of 300 during the first week of the St. Louis training program, which corresponded with the opening of the vacation season. Second-week attendance was 400. Program will run for 10 weeks, each class is for a 3-hour period.

ANDREA'S 19-IN. COLOR SET will be ready for sale this fall, according to F. A. D. Andrea, the firm's prexy. Production on the 15-in. set, announced in April *Color Shorts*, has been dropped. "Developments in the television field," says Andrea, "have confirmed my early convictions to the effect that a small screen would not sell and is not a practical investment . . . I sincerely believe that this larger picture is the ideal size to start with."

CLOSED-CIRCUIT TV SYSTEMS for educational and industrial applications can now operate in full color. As a result of a recent patent license agreement with CBS, GE is now making such equipment. The color system used is not similar to the present commercial one approved by the FCC. Instead it is based on the old field-sequential system formerly given FCC approval. GE says this technique was chosen after comparative field tests because it provides superior color reproduction, makes possible better image detail and offers the user lower initial-equipment and operating costs . . . GE has also shipped complete color slide origination equipment to KING-TV, Channel 5, Seattle, Wash., will also ship color film origination equipment. KING-TV will begin regular color programming by early fall.

DU MONT NETWORK begins color telecasts this fall. Programs will originate from WABD, Channel 5, Du Mont's New York outlet. Dr. Du Mont feels that development of economical large-screen color pix tubes is breaking the log-jam in color TV. Receivers under this brand name, using the 19-in. Chroma-Sync Teletron, are expected to be available this fall.

TESTING REQUIREMENTS and test procedures for color-TV took up all of the June issue of the *Technician's Timesaver*, monthly test-equipment publication of Simpson Electric Co. Typical response curves and test set-ups are illustrated for color sets. Use of the Chromatic Probe and Chromatic Amplifier in adapting existing test instruments for color service is also illustrated.

CBS VERSION OF THE 3-GUN TUBE, designated 15HP22, is the subject of a 4-page data and application folder released by that manufacturer. As we go to press, CBS also announces a 19-in. version of their 3-gun design. This larger crt is being designated Colortron 205.

MOTOROLA MOBILE LAB is touring the country to check color TV performance and reception conditions under a wide variety of local conditions. These "on-location" checks are being conducted, says the manufacturer, because it is impossible to simulate interference,



snow and fringe problems, together with their effects on color reception, in the fixed-installation engineering department. The mobile lab truck, in addition to \$20,000 worth of elaborate testing gear, carries a full staff of engineers and technicians.

BIGGER PIX, LOWER PRICE: More news from Motorola comes in the form of an announcement of 3 color receivers, all using the CBS 19-in. color tube and each selling below \$1000—or below previously announced prices for sets using 15-in. pix tubes. Basic price for one of these sets is \$895.

Paul L. Galvin, Motorola prexy, in making the announcement also predicted his company would sell 25,000 of these color sets this fall. However, he still expects his monochrome receivers to outsell the new color models by a ratio of about 25 to 1.

Decision to market color now, after a wait-and-see period, was prompted by availability of larger crt, increase in color TV programming, and ability to market at a reasonable price.

COLOR SHORTS

NATIONWIDE COLOR TRAINING PROGRAM being launched by Du Mont includes inauguration of a special school for service personnel of the manufacturer's distributors and dealers. Course of instruction will last one week, but will be repeated on a weekly basis to accommodate as many people as possible. The size of each group, however, will be limited to permit concentrated training.

CHROMATIC TV LABS has signed a 10-yr. agreement with N. V. Philips of Holland covering worldwide manufacture of the Chromatron, the Lawrence single-gun color crt. The pact covers all markets except the United States and Canada.

ADVANCED TRAINING in color servicing right at the Motorola factory, to begin shortly after Labor Day, is available free to independent dealers and service associations who wish to send representatives to the manufacturer's plant. The program will involve lab and experimental work on live sets, and includes some book work. This school will be implemented by local color service lectures in color markets. The students' only expenses will be for travel and living costs. Tim Alexander, Motorola service director, has sent 180 invitations to associations; dealer invitations are in the hands of local company distributors. Variations in color pix tubes and circuits will be covered.

A SERIES OF SEMINARS on color service techniques is now under way at Western Television Institute of Los Angeles. A Westinghouse color receiver is being used for actual tests and measurements.

IMPACT OF LARGE CRT's on the color outlook may be judged by the recent RCA announcement of a price slash on its receiver using the 15-in. 3-gun tube. Originally listed at \$1000, this small-pix receiver is now available at \$495. Purchasers at the higher price will get rebates from the manufacturer to cover the difference. Reason for the move: to clear out inventories of the small-screen sets, make way for the manufacturer's forthcoming line, which will use a larger tube.

JOHN F. RIDER plans on publishing Bob Middleton's book on color servicing in the near future. The volume, intended to emphasize the practical rather than the theoretical, will incorporate much of the material developed during the Simpson-Middleton practical demonstrations.

DON'T OVERLOOK PHILCO in the battle of the color pix tubes. James H. Carmine, newly elected Philco prexy, reveals a 21-in. rectangular crt which, he believes, can be mass-produced at a comparatively low cost. Shadow masks and other complicated structures inside the tube are eliminated, and there are no practical limitations on tube size. A single gun is used. As for the availability of color receivers, this manufacturer does not intend to offer any for sale this year. Carmine doesn't think that color sets offered to the public so far are suited to mass production. Philco is being cautious because "color television is too big and too important to risk false starts."

COLOR SETS IN USE BY 1957 will number 7½ million. By 1964, the figure will be 37½ million, in contrast with 30 million monochrome sets in use today. So says John T. Thompson, manager of distributor sales for the GE Tube Department. Development of larger color crt's now going on in all competing types, he believes, will lead to "some action" in color sales in '55, with volume business becoming a reality in '56.

LOW-DRIFT CRYSTALS for use in sub-carrier oscillator circuits of color receivers are now available from Standard Piezo Company, Carlisle, Penna. These 3.579545 mc crystals are being made to a tolerance of 0.003% over a wide temperature range. They are hermetically sealed in containers filled with dry nitrogen.

SIMPSON LECTURES and demonstrations, conducted by Bob Middleton, were recently held in the Denver-Utah area, are now touring elsewhere. Correct testing techniques for checking chrominance and other color circuits, along with the instruments used, are shown on an actual receiver. The theoretical approach is by-passed in favor of how-to-do-it demonstrations.

TECHNICIAN

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YOUR COLOR TV REFERENCE LIBRARY

The first complete color TV chart, of terminology and systems is presented in this section of **TECHNICIAN**. It describes all important technical terms, picture tubes, receiver equipment, and broadcast systems in handy quick-reference form. This chart is another valuable addition to the comprehensive series of color TV articles published in **TECHNICIAN**. (For a complete listing of color TV articles published in previous issues, see below.) With color TV gaining increasing momentum, resulting in more servicing business, you will find this series of technical features to be a required reference, explaining clearly and fully the practice and theory of the new medium.

COLOR TV NEWS ROUND UP

SLOW START for color TV has been blamed on three factors: 1) Small screens, 2) expensive receivers, 3) few color programs. These obstacles have been overcome in varying degrees, and by the end of the year some 40,000 color sets will have been produced. Rising tempo offers prospects of several hundred thousand color receivers in 1955.

COLOR PICTURE TUBES, long the big bottleneck, are being made available in the 19-21 in. sizes well accepted by the public. RCA scheduled a demonstration of an improved 21-in. tube on Sept. 15. CBS' 19-in. tube with 205 sq. in. picture area is already in mass production. DuMont has developed a 19-in. tube. These three are of the aperture type. Chromatic is making large-size post deflection grid type color tubes. Philco has an experimental tube that eliminates aperture masks and grids. Exactly which tube will gain greatest public acceptance is still in question, but this important hurdle no longer seems imposing.

RECEIVER AVAILABILITY is easing up and prices have dropped. Price range for color sets is \$495 to \$1100. Gen-

erally, receivers with 15-in. tubes are selling for \$500-\$600, and 19-in. sets for \$900-\$1000. Companies which have already announced color models are Admiral, Andrea, Capehart, CBS, Emerson, GE, Hallicrafters, Motorola, RCA, Raytheon, Stromberg, and Westinghouse. Among the companies with plans for early introduction of color sets are Crosley, DuMont, Philco and Zenith.

PROGRAMMING is gaining in leaps and bounds, particularly network shows scheduled for this fall. CBS and NBC have set up elaborate color studio facilities to originate an extensive series of major shows. DuMont is initiating a program of several weekly color films. ABC will be moving into color soon. The Bell System is now equipped to carry color TV programs to 65 cities with 95 stations. By the end of 1954 network color will be available to 95 cities with 125 stations.

TEST EQUIPMENT manufacturers are gearing to meet the large demand anticipated for color servicing instruments. Among those test units made available are the color bar generator, dot generator, wideband oscilloscope, and improved sweep generator.

Color TV Programs Scheduled for Coming Month

Date	Network	Time (EDT)	Program
Oct. 4	CBS	10-10:30 am	Garry Moore Show
Oct. 4	CBS	8-8:30 pm	Burns and Allen
Oct. 10	NBC	7:30-9 pm	Max Liebman Spectacular
Oct. 13	CBS	10-11 pm	Best of Broadway
Oct. 14	NBC	9:30-10 pm	Ford Theatre
Oct. 18	NBC	8-9:30 pm	Tonight at 8:30
Oct. 18	CBS	3:30-4 pm	Bob Crosby Show
Oct. 18	CBS	10-11 pm	Studio One
Oct. 21	NBC	9:30-10 pm	Ford Theatre
Oct. 23	NBC	9-10:30 pm	Max Liebman Spectacular
Oct. 23	CBS	9-9:30 pm	Two for the Money
Oct. 25	CBS	9:30-10 pm	December Bride
Oct. 26	CBS	8:30-9:30 pm	Shower of Stars
Oct. 28	NBC	9:30-10 pm	Ford Theatre
Oct. 29	CBS	8-8:30 pm	Mama
Oct. 31	NBC	4-6 pm	Macbeth
Nov. 1	CBS	8:30-9 pm	Godfrey's Talent Scouts
Nov. 4	CBS	2:30-3 pm	Linkletter's House Party
Nov. 5	CBS	2:30-3 pm	Linkletter's House Party
Nov. 5	CBS	7:45-8 pm	Perry Como Show

COLOR TV BIBLIOGRAPHY

Articles and receiver circuits which have appeared in **TECHNICIAN**

Title	Issue	Pg. No.
Here's Your First Schematic of a Color-TV set	9-53	32
Serviceman's Analysis of the New Color TV System	10-53	42
What to Tell Your Customers About Color TV	10-53	52
Color vs Black & White TV Receivers	11-53	38
Picture Tubes for Color-Television	12-53	32
Color TV is Coming Fast (incl. Color schematic)	12-53	Sec. 2
How Color Signals are Squeezed into the B & W Spectrum	1-54	26
More About Color TV Fundamentals	2-54	24
Serviceman's Analysis of Color Stages	3-54	26
The Chromatron: A Single-Gun Color Tube	3-54	36
Understanding the Matrix-Adder Section of the Color TV Receiver	4-54	18
Matrix-Adder Troubles in the Color TV Receiver	5-54	26
Servicing Convergence Trouble in the Color TV Receiver	6-54	16
The 3-Gun Color Teletron	6-54	20
Color Schematic of RCA Model CT-100 including Service Data	6-54	Circuit Digest Sec.
Improper Tinting Troubles in the Color TV Receiver	7-54	16
New CBS and RCA Large-Screen Color Tubes	8-54	61
Servicing Improper Picture Tinting in the Color Receiver	9-54	14

COLOR SHORTS

COLOR FLASHES: The false starts are over; the industry seems settled on a firm basis for production and marketing. Newest **TECHNICIAN** guesstimate on color set sales for '55: 300,000—or more! . . . First rectangular color crt using 3 guns and a shadow mask is claimed by Du Mont. . . . Delivery of big-screen color pix tubes to set manufacturers is now being made in

freight carload quantities. . . . Motorola large-pix color sets are now on sale in key cities. . . . Color sales are expected to give a shot in the arm to the sagging list-price structure. Demand is expected to exceed supply, which means dealers will be asking—and getting—list prices.

THE SIMPSON COLOR CARAVAN, headed by Bob Middleton, is

winding up a tour of the Pacific Northwest. The practical color servicing demonstrations, performed on color receivers, were given in 8 cities in the states of Idaho, Montana, Oregon and Washington.

DU MONT CLAIMS A FIRST with a 21-in. rectangular shadow-mask color crt that has a picture area of approximately 225 sq. in. The tube uses a metal cone. Now that a rectangular prototype using 3 guns and a shadow mask has been



Dr. A. B. Du Mont, the new 21-in. rectangular pix tube, and F. B. Rice, Tube Division mgr.

successfully developed, Du Mont engineers are at work on glass-shell versions in 21-in. and 22-in. sizes. Sample rectangular large-size tubes are expected to be available this year, with quantity production in '55.

CARLOAD LOTS of large-screen tubes, according to CBS-Hytron, are being dispatched on a regular basis to set manufacturers. With mass production well under way, CBS-Hytron president Charles F. Strome foresees a chance that color sets may be available in quantity by Christmas. He expects his company alone to produce more than 30,000 of the large color tubes during the rest of the year.

NO COLOR THIS FALL is the policy of Sylvania Electric. Bernard Holsinger, Sylvania sales mgr., said the public will not be ready for color until large-screen pictures are available in combination with more moderate prices. Sylvania's 1955 line will concentrate on monochrome.

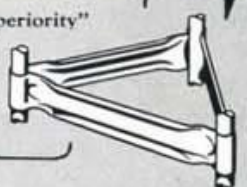
WESTINGHOUSE COLOR SCHOOLS now being conducted in about 50 cities are expected to draw technicians representing more than 10,000 TV retailers, as well as independent technicians. The concentrated 8-hour courses deal with practical problems, and give attending servicers the chance to get the feel of color service by using actual receivers.

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